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10/805,748	03/22/2004	Nasreen Chopra	10030543-1	9580

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EXAMINER
REDDING, THOMAS M

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/805,748	CHOPRA ET AL.
	Examiner	**Art Unit**	
	Thomas M. Redding	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>22 March 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date <u>7/12/2007</u>.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1.   The attempt to incorporate subject matter into this application by reference to
Attorney Docket Number 10021084 is ineffective because the reference document is
not clearly identified as required by 37 CFR 1.57(b)(2), i.e. the US application number
was not provided (Specification page 7, line 10).

The incorporation by reference will not be effective until correction is made to
comply with 37 CFR 1.57(b), (c), or (d). If the incorporated material is relied upon to
meet any outstanding objection, rejection, or other requirement imposed by the Office,
the correction must be made within any time period set by the Office for responding to
the objection, rejection, or other requirement for the incorporation to be effective.
Compliance will not be held in abeyance with respect to responding to the objection,
rejection, or other requirement for the incorporation to be effective. In no case may the
correction be made later than the close of prosecution as defined in 37 CFR 1.114(b), or
abandonment of the application, whichever occurs earlier.

Any correction inserting material by amendment that was previously incorporated
by reference must be accompanied by a statement that the material being inserted is
the material incorporated by reference and the amendment contains no new matter. 37
CFR 1.57(f).

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1-8, 12-22, 25 and 26 are rejected under 35 U.S.C. 102(b) as being

anticipated by Harvey (US 005249259).

        Regarding claim 1, Harvey discloses [a] method for providing feedback during an

inspection of an object, the method comprising:

        receiving first image data representing the object, the first image data being

produced using an image parameter ("The system of FIG. 1 also includes a digitizer unit

18 which digitizes the input image data 16, and a locate /focus/adjust unit 20 which

locates patterns within the input image data 16, provides control to the digitizer unit, and

receives feedback from the classifier module 14", Harvey, column 3, line 20, and

figure1, the locate/focus/adjust unit must start at some initial setting);

        determining parameter modification information for the image parameter from the

first image data ("receives feedback from the classifier module 14", Harvey, column 3,

line 24, and figure1, reference 14, Harvey's system as shown in figure 1 calculates

parameters for the digitizer based on results from the classifier);

modifying the image parameter to a modified image parameter with the

parameter modification information ("provides control to the digitizer unit", Harvey,

column 3, line 20, and figure1, reference 20, the locate/focus/adjust unit must start at

some initial setting);

and receiving second image data representing the object, the second image data

being produced using the modified image parameter (Harvey, figure 1, modifying the

focus setting is only useful if a subsequent image is recorded).

Regarding claim 2, Harvey discloses wherein the image parameter is an image

acquisition parameter (Harvey, figure 1, focus is an image acquisition parameter)"

Regarding claim 3, Harvey discloses wherein said determining includes

processing the first image data to calculate the parameter modification information for

the image acquisition parameter (Harvey figure 1, the classifier module processes the

image data, the locate/focus/adjust unit modifier digitizer settings based on feedback

from the classifier).

Regarding claim 4, Harvey discloses wherein said producing the first image data

includes capturing a first image of the object, and wherein said producing the second

image data includes capturing a second image of the object (Harvey, figure 1, modifying

the focus setting is only useful if an subsequent image is recorded).

Regarding claim 5, Harvey discloses wherein said determining further includes

determining an incorrect classification of at least one feature of the object based on the

first image data as a result of an original setting of the image acquisition parameter,

calculating the parameter modification information to correct the incorrect classification

and modifying the original setting of the image acquisition parameter to a modified

setting based on the parameter modification information (Harvey, figure 1, the digitizer

adjustments are controlled by feedback from the classifier module).

Regarding claim 6, Harvey discloses wherein said producing the first image data

includes producing first raw image data representing the first image using the original

setting of the image acquisition parameter,

and wherein said producing the second image data includes producing second

raw image data representing the second image using the modified setting of the image

acquisition parameter (Harvey, figure 1, modifying the focus setting is only useful if an

subsequent image is recorded, modifying focus would affect the raw image).

Regarding claim 7, Harvey discloses wherein the image acquisition parameter is

at least one of an illumination parameter, resolution parameter, sensor parameter or

image view parameter (Harvey, figure 1, the locate/focus/adjust unit adjusts the digitizer

focus, focus is a parameter of the digitizer, it also affects the systems ability to resolve

detail).

Regarding claim 8, Harvey discloses [t]he method of Claim 1, wherein the at

least one parameter is an image processing parameter ("The method may be adapted

for determining, for neurons of a neural network, a set of interconnection weights which

will enable the network to approximate a prespecified output when presented with a

predetermined set of input data. In that adaptation, the initial possible set of

interconnection weights is assembled, and matrix computations are performed on the

input data and on the successor matrices to generate an output of each successor

matrix. A metric is computed corresponding to the difference between each generated

output and the prespecified output, and the successor matrix is selected based on the

metrics", Harvey, column 1, line 46).

Regarding claim 12, Harvey discloses, [a] method for providing feedback during

an inspection of an object, the method comprising:

setting at least one image acquisition parameter to capture a first image of the object;

determining parameter modification information from image data representing the first

image ("The system of FIG. 1 also includes a digitizer unit 18 which digitizes the input

image data 16, and a locate /focus/adjust unit 20 which locates patterns within the input

image data 16, provides control to the digitizer unit, and receives feedback from the

classifier module 14", Harvey, column 3, line 20, and figure1, the locate/focus/adjust unit

must start at some initial setting);

and modifying the image acquisition parameter based on the parameter modification

information to capture a second image of the object (Harvey, figure 1, modifying the

focus setting is only useful if a subsequent image is recorded).

Regarding claim 13, Harvey discloses wherein said determining includes

processing the image data to measure the parameter modification information (Harvey

figure 1, the classifier module processes the image data, the locate/focus/adjust unit

modifier digitizer settings based on feedback from the classifier).

Regarding claim 14, Harvey discloses wherein said determining further includes

determining an incorrect classification of at least one feature of the object based on the

image data as a result of said setting (Harvey, figure 1, the digitizer adjustments are

controlled by feedback from the classifier module).

Regarding claim 15, Harvey discloses wherein said determining the parameter

modification information further includes determining the parameter modification

information to correct the incorrect classification and produce an adequate classification

from the second image (Harvey, figure 1, the digitizer adjustments are controlled by

feedback from the classifier module).

Regarding claim 16, Harvey discloses wherein the image acquisition parameter

is at least one of an illumination parameter, resolution parameter, sensor parameter or

image view parameter (Harvey, figure 1, the locate/focus/adjust unit adjusts the digitizer

focus, focus is a parameter of the digitizer, it also affects the systems ability to resolve

detail).

Regarding claim 17, Harvey discloses [a]n inspection system for providing

feedback during an inspection of an object, comprising:

a processor connected to receive first image data representing the object ("a program

controlled computer", Harvey, column 1, line 31, and figure 1, Harvey's method is

running on hardware),

the first image data being produced using an image parameter ("The system of FIG. 1

also includes a digitizer unit 18 which digitizes the input image data 16, and a locate

/focus/adjust unit 20 which locates patterns within the input image data 16, provides

control to the digitizer unit, and receives feedback from the classifier module 14",

Harvey, column 3, line 20, and figure1, the locate/focus/adjust unit must start at some

initial setting);

said processor being operable to determine parameter modification information for the

image parameter from the first image data for use in producing second image data

representing the object ("receives feedback from the classifier module 14", Harvey,

column 3, line 24, and figure1, reference 14, Harvey's system as shown in figure 1

calculates parameters for the digitizer based on results from the classifier).

Regarding claim 18, Harvey discloses a sensor disposed in relation to the object to receive illumination projected from the object capture a first image of the object and produce first raw image data representing the first image, said sensor being connected to provide the first raw image data to said processor ("The system of FIG. 1 also includes a digitizer unit 18 which digitizes the input image data 16", Harvey, column 3, line 20, and figure1).

Regarding claim 19, Harvey discloses wherein said processor includes an image analysis processor operable to process the first raw image data to produce first processed image data ("a program controlled computer", Harvey, column 1, line 31, and figure 1, Harvey's method is running on hardware).

Regarding claim 20, Harvey discloses wherein the first raw image data is the first image data, and wherein the image analysis processor is operable to process the first raw image data to measure the parameter modification information for the image parameter ("The system of FIG. 1 also includes a digitizer unit 18 which digitizes the input image data 16, and a locate /focus/adjust unit 20 which locates patterns within the input image data 16, provides control to the digitizer unit, and receives feedback from the classifier module 14", Harvey, column 3, line 20, and figure1, the feedback from the classifier is used to calculate the parameter modification for the digitizer)

Regarding claim 21, Harvey discloses wherein the first processed image data is

the first image data (Harvey, figure 1, the first image is analyzed and adjustments are

made for a subsequent image),

and wherein said processor further includes a classification processor connected

to receive the processed image data (Harvey, figure 1, reference 14),

determine an incorrect classification of at least one feature of the object based on

the processed image data as a result of an original setting of the image parameter,

calculate the parameter modification information to correct the incorrect classification

and modify the original setting of the image parameter to a modified setting based on

the parameter modification information (Harvey, figure 1, connection from classifier 14

to Locate/Focus/Adjust unit 20, classification result is used to adjust the digitizer).

Regarding claim 22, Harvey discloses wherein said sensor is further configured

to capture a second image of the object and produce second raw image data

representing the second image using the modified setting of the image parameter

(Harvey, figure 1, modifying the focus setting is only useful if an subsequent image is

recorded).

Regarding claim 25, Harvey discloses [t]he inspection system of Claim 18,

wherein the image parameter is a sensor parameter associated with said sensor ("a

locate /focus/adjust unit 20 which locates patterns within the input image data 16,

provides control to the digitizer unit, and receives feedback from the classifier module

14", Harvey, column 3, line 21, focus is a parameter associated with the digitizer).

Regarding claim 26, Harvey discloses wherein the sensor parameter is at least

one of an exposure duration of said sensor or a resolution associated with the first raw

image data (Harvey, figure 1, the locate/focus/adjust unit adjusts the digitizer focus,

focus is a parameter of the digitizer, it also affects the systems ability to resolve detail).

4.   Claims 1, 8-11, 17-19, 21, 23 and 24 are rejected under 35 U.S.C. 102(b) as

being anticipated by Shibata et al (US 2002/0027653).

Regarding claim 1, Shibata discloses [a] method for providing feedback during

an inspection of an object, the method comprising:

      receiving first image data representing the object, the first image data being

produced using an image parameter ("the chip detection optical system 20 retrieves an

image of an entire chip", Shibata, paragraph 94, and "differential images with adjacent

chips are determined and a test inspection is performed to determine detection

sensitivity parameters such as concentration threshold values used to evaluate defects",

Shibata, paragraph 95);

      determining parameter modification information for the image parameter from the

first image data ("a test inspection is performed to determine detection sensitivity

parameters such as concentration threshold values used to evaluate defects", Shibata,

paragraph 95);

modifying the image parameter to a modified image parameter with the

parameter modification information ("An inspection recipe is generated based on the

information registered at step 80, step 83, step 84, step 85, step 86, and step 87",

Shibata, paragraph 96);

and receiving second image data representing the object, the second image data

being produced using the modified image parameter ("At step 88, the main inspection is

performed using the inspection recipe generated previously", Shibata, paragraph 97 and

"the inspection recipe generated previously is used to determine differential images

between adjacent chips or differential images between identically shaped patterns

within a single chip, and the inspection sensitivity parameters set up at step 87 are used

to detect defects", Shibata, paragraph 98).

Regarding claim 8, Shibata discloses [t]he method of Claim 1, wherein the at

least one parameter is an image processing parameter ("the inspection sensitivity

parameters set up at step 87 are used to detect defects", Shibata, paragraph 98 the

inspection sensitivity parameters set up at step 87 are used to detect defects", Shibata,

paragraph 98).

Regarding claim 9, Shibata discloses wherein said determining includes

determining an incorrect classification of at least one feature of the object based on the

first image data as a result of an original setting of the image processing parameter

("Thus, if the sums of the differences are large, there is a greater tendency to generate

false detections. To reduce these false detections, threshold values for individual chips

can be adjusted according to the sum of the differential images with adjacent chips,

based on the chip images", Shibata, paragraph 83),

calculating the parameter modification information to correct the incorrect classification

and modifying the original setting of the image processing parameter to a modified

setting based on the parameter modification information ("To reduce these false

detections, threshold values for individual chips can be adjusted according to the sum of

the differential images with adjacent chips, based on the chip images", Shibata,

paragraph 83).

　　　　Regarding claim 10, Shibata discloses wherein said producing the first image

data includes processing raw image data representing an image of the at least one

feature of the object using the original setting of the image processing parameter to

produce the first image data (Shibata, figure 11, references 83-87 correspond to the test

inspection described above),

and wherein said producing the second image data includes processing the raw image

data using the modified setting of the image processing parameter to produce the

second image data (Shibata, figure 11, reference 88, is a second inspection using a

modified setting resulting from the test inspection).

Regarding claim 11, Shibata discloses wherein the image processing parameter

is at least one of a processing type parameter or a processing complexity parameter

("At step 88, the main inspection is performed using the inspection recipe generated

previously", Shibata paragraph 97, Shibata's "recipe" defines the type of processing

steps to occur)

Regarding claim 17, Shibata discloses [a]n inspection system for providing

feedback during an inspection of an object, comprising:

a processor connected to receive first image data representing the object ("a camera 21

generates a chip image. This image is transferred to an image processing module 30",

Shibata, paragraph 31),

the first image data being produced using an image parameter ("Thus, if the sums of the

differences are large, there is a greater tendency to generate false detections. To

reduce these false detections, threshold values for individual chips can be adjusted

according to the sum of the differential images with adjacent chips, based on the chip

images", Shibata, paragraph 83, there must be some threshold for the initial image),

said processor being operable to determine parameter modification information for the

image parameter from the first image data for use in producing second image data

representing the object ("threshold values for individual chips can be adjusted according

to the sum of the differential images with adjacent chips, based on the chip images",

Shibata, paragraph 83).

Regarding claim 18, Shibata discloses [t]he inspection system of Claim 17 further

comprising:

a sensor disposed in relation to the object to receive illumination projected from the

object (Shibata, figure 1, reference 21 – a camera),

capture a first image of the object and produce first raw image data representing the

first image ("a camera 21 generates a chip image. This image is transferred to an image

processing module 30", Shibata, paragraph 31),

said sensor being connected to provide the first raw image data to said processor

(Shibata, figure 1, line connecting camera 21 to image processing module 30).

Regarding claim 19, Shibata discloses wherein said processor includes an image

analysis processor operable to process the first raw image data to produce first

processed image data ("a camera 21 generates a chip image. This image is transferred

to an image processing module 30", Shibata, paragraph 31).

Regarding claim 21, Shibata discloses wherein the first processed image data is

the first image data, and wherein said processor further includes a classification

processor connected to receive the processed image data ("a camera 21 generates a

chip image. This image is transferred to an image processing module 30", Shibata,

paragraph 30 and figure 8, row 2, regions are being classed by defect rate, defect rates

are used to judge pass/reject state of wafer),

determine an incorrect classification of at least one feature of the object based on the

processed image data as a result of an original setting of the image parameter ("In this

feature, statistical data for candidates evaluated to be false detections through reviews

or automatic defect classification is obtained", Shibata, paragraph 67), calculate the

parameter modification information to correct the incorrect classification and modify the

original setting of the image parameter to a modified setting based on the parameter

modification information ("defects are re-evaluated with a higher defect candidate

evaluation threshold value if the coordinates of the defects detected by the inspection

device lie within a region having high false detection rates", Shibata, paragraph 67).

Regarding claim 23, Shibata discloses wherein said image analysis processor is

further operable to process the first raw image data using the modified setting of the

image parameter to produce second processed image data ("defects are re-evaluated

with a higher defect candidate evaluation threshold value if the coordinates of the

defects detected by the inspection device lie within a region having high false detection

rates", Shibata, paragraph 67).

Regarding claim 24, Shibata discloses wherein the image parameter is at least

one of a processing type parameter or a processing complexity parameter ("At step 88,

the main inspection is performed using the inspection recipe generated previously",

Shibata paragraph 97, Shibata's "recipe" defines the type of processing steps to occur).

5.   Claims 17, 18, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated

by Ganz et al. (US 2004/0105575 A1).

        Regarding claim 17, Ganz discloses [a]n inspection system for providing

feedback during an inspection of an object, comprising: a processor connected to

receive first image data representing the object3 (Ganz, figure 1, reference 105 –

computer, and "Cameras 155 and 135 take images of each well and transmit the

images to computer 105", Ganz, paragraph 55),

        the first image data being produced using an image parameter ("The computer

coordinates the movement of the linear actuators to properly position cameras 155 and

135 above each well of each micro-well plate 125A-125F in sequence", Ganz,

paragraph 55),

        said processor being operable to determine parameter modification information

for the image parameter from the first image data for use in producing second image

data representing the object ("Motor 130 of linear actuator 160 moves moving plate 162

upward and/or downward as necessary to properly focus lens 165 on the drop of

hanging liquid over well A1. Preferably, lens 165 is set at a predetermined zoom", Ganz,

paragraph 66, feedback is used to control the plate to get into proper focus).

        Regarding claim 18, Ganz discloses [t]he inspection system of Claim 17, further

comprising:

a sensor disposed in relation to the object to receive illumination projected from

the object capture a first image of the object and produce first raw image data

representing the first image, said sensor being connected to provide the first raw image

data to said processor ("Camera 155 (FIG. 10) inspects well A1 and transmits an image

to computer 105 for digitization", Ganz, paragraph 75)

Regarding claim 27, Ganz discloses [t]he inspection system of Claim 18, wherein

the image parameter is a view parameter controlling the positional relationship between

said sensor and the object ("Motor 130 of linear actuator 160 moves moving plate 162

upward and/or downward as necessary to properly focus lens 165 on the drop of

hanging liquid over well A1. Preferably, lens 165 is set at a predetermined zoom", Ganz,

paragraph 66, feedback is used to control the plate to get into proper focus). ("Motor

130 of linear actuator 160 moves moving plate 162 upward and/or downward as

necessary to properly focus lens 165 on the drop of hanging liquid over well A1.

Preferably, lens 165 is set at a predetermined zoom", Ganz, paragraph 66, feedback is

used to control the plate to get into proper focus).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, if the differences between the subject matter sought to be patented and
the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Ganz (US 2004/0105575 A1) in combination with Parker et al. (US 005533139).

Regarding claim 28, Ganz discloses [t]he inspection system of Claim 18 further

comprising: an illumination source disposed in relation to the object to illuminate the

object ("light from light guide 195 can be projected through the well plates when they

are brought into position for inspection", Ganz, paragraph 71).

Ganz does not disclose the image parameter being an illumination parameter

controlling said illumination source.

Parker teaches an image parameter being an illumination parameter controlling

said illumination source ("Coupled to the light source is a light level control means for

varying the illumination intensity passing through the output aperture" Parker, column 2,

line 36, and "An image processor is coupled so as to control the light level control

means and receive the output of the image acquisition means", Parker, column 2, line

42).

It would have been obvious at the time the invention was made for one of

ordinary skill in the art to combine the feedback controlled light source of Parker with the

inspection system of Ganz to keep the image signal in an optimal range for the camera

system ("These are the aperture positions for which the gray level histogram means of

acquired image data are nominally midrange", Parker, column 10, line 59).

Regarding claim 30, the combination of Ganz and Parker teaches wherein said

illumination source illuminates the object with light ("An image processor is coupled so

as to control the light level control means and receive the output of the image

acquisition means", Parker, column 2, line 42).

8.   Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Shibata et al (US 2002/0027653) in combination with Rao et al (US 006834117B1)

and McKee, Jr. et al. (US 005311568A).

Regarding claim 28, Shibata discloses the inspection system of Claim 18, as

described above.

Shibata does not disclose and inspection system further comprising: an

illumination source disposed in relation to the object to illuminate the object, the image

parameter being an illumination parameter controlling said illumination source.

Rao, working in the same field of endeavor of semiconductor wafer inspection

does teach an illumination source disposed in relation to the object to illuminate the

object (McKee, figure 3, reference 20, X-Ray source).

It would have been obvious at the time the invention was made to combine the X-Ray source of Rao with the inspection system of Shibata to detect the presence of relatively small (e.g., on the order of 0.2 μm diameter) voids in copper conductors (Rao, column 4, line 42, and "This reduction in feature size has also reduced the minimum size of a killing void further below the visibility of optical microscopy", Rao, column 1, line 60).

The combination of Shibata and Rao does not teach an image parameter being an illumination parameter controlling said illumination source.

McKee, working in a similar problem solving area of controlling X-Ray sources, does teach an image parameter being an illumination parameter controlling said illumination source ("The sampled light is used in a feedback mode to adjust the output of the x-ray source such that the intensity of light from the sampled position of the output screen 22 is maintained at a constant level", McKee, column 6, line 9).

It would have been obvious at the time the invention was made for one of ordinary skill in the art to combine the source intensity feedback control method of Mckee with the inspection system of the Shibata and Rao combination in order to keep the image signal in an optimal range for the camera system.

Regarding claim 29, the combination of Shibata, Rao and McKee does teach

[t]he inspection system of Claim 28, wherein said illumination source illuminates the

object with a beam of X-rays (McKee, figure 3, reference 20, X-Ray source).
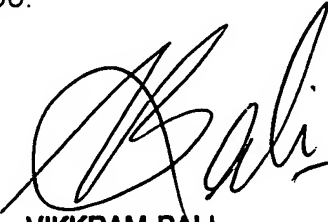
Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Thomas M. Redding whose telephone number is (571)

270-1579. The examiner can normally be reached on Mon - Fri 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TMR/

VIKKRAM BALI
PRIMARY EXAMINER